

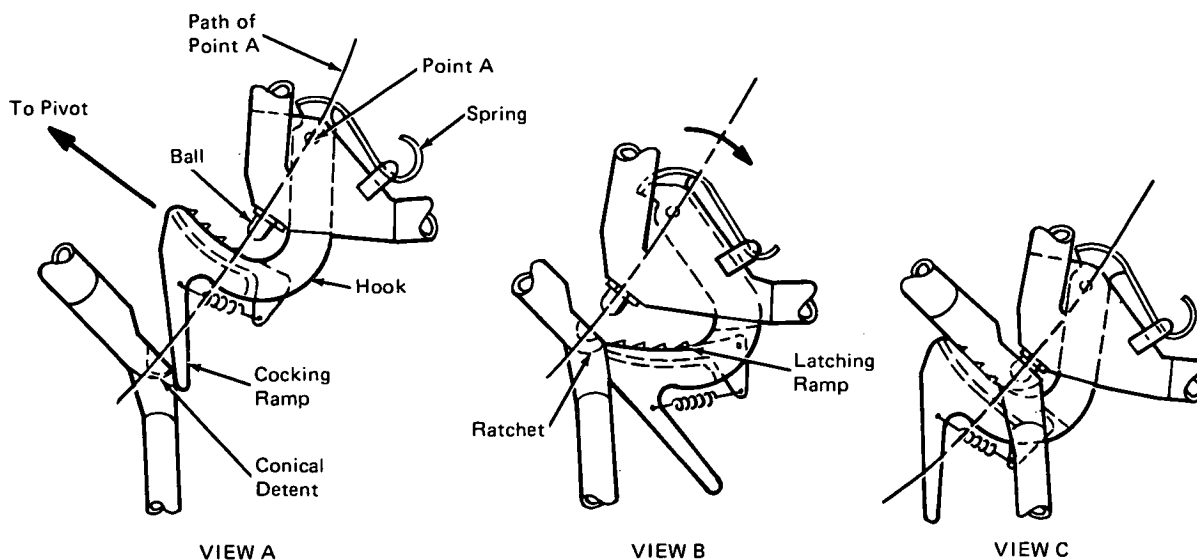
NASA TECH BRIEF

Marshall Space Flight Center



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Latch Mechanism



Latch Locking Sequence

The problem:

Design a latch mechanism, without an auxiliary power source, that will positively lock two pivoted structures upon contact.

The solution:

Use ratchet device that transfers loads imposed on the latch to the support structure before the loads have to be resisted by the latch springs.

How it's done:

Most latch mechanisms have a small amount of slack, or play, that is usually removed after locking through use of an auxiliary power source, or the latch is precocked to a preloaded position. This particular latch mechanism positively locks the two structures on contact and is irreversible prior to completion of latching. The device is capable of carrying loads in all directions, will latch

when misaligned, and has zero slack in low load levels. The latch system is passive in that it uses no external power, and it is not precocked. The loads resisted by the latch are required to go through a rigid structure or through a friction interface before the preloaded spring force resists it.

As the structures approach each other (View A), the cocking ramp pivots the hook about point A, cocking the latch. In this position the hook is cocked and preloaded to force the hook into the latched position. As the two structures close together (View B) contact is made at the ball and conical detent forcing the structures towards an aligned position. As this is taking place, the hook is closed while contacting the latching ramp. During this time the ratchet teeth are engaging to prevent back-up beyond a ratchet tooth. The spring load on the hook, and the latching ramp act as a wedge forcing the structures together (View C).

(continued overleaf)

Notes:

1. Information concerning this innovation may be of interest to the automotive industry and hardware companies.
2. No additional documentation is available. Specific questions, however, may be directed to:
Technology Utilization Officer
Marshall Space Flight Center
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Huntsville, Alabama 35812
Reference: B72-10457

Patent status:

Inquiries about obtaining patent rights to this invention may be made to:

Patent Counsel
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